Korenix JetI/O 6550
Industrial Intelligent Ethernet I/O Server

User's Manual

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www.korenix.com

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Index

1 Introduction 1
1.1 Overview 1
1.2 Major Features 2
1.3 Package Checklist 2
1.4 Product Specification 3
2 Hardware Installation 4
2.1 Hardware Introduction 4
2.2 Wiring Power Input 5
2.3 Wiring I/O Connectors 6
2.4 JetI/O 6550 Wiring Example 6
2.5 Wiring Earth Ground 7
2.6 Wiring Fast Ethernet Ports 7
2.7 Din-Rail Mounting Installation 7
3 Preparation for Management 9
4.1 Understand the Ethernet I/O Architecture 9
4.2 Preparation for Remote Management 9
4 Feature Configuration 11
4.1 Block I/O Configuration Utility 11
4.2 Block I/O OPC Server Utility 20
4.3 Device Finder Utility 23
4.4 SNMP 23
4.5 Web UI 24
4.6 How to Upgrade Firmware 24
5 Modbus/TCP Command Set 26
5.1 Introduction of Modbus/TCP Protocol 26
5.2 JetI/O 6550 Modbus/TCP Address Mapping 27
6. Appendix 42
6.1 SNMP MIB 42
6.2 Revision History 44

1 Introduction

Welcome to Korenix *JetI/O 6500* Series Industrial Managed Ethernet I/O Module User Manual. Following topics are covered in this chapter:

1.1 Overview

1.2 Major Features

1.3 Package Checklist

1.1 Overview

JetI/O 6500 series is a series of Managed Ethernet I/O modules for distributive monitoring and controls. The JeI/O 6500 series equipped with one Ethernet port and multiple channels Analog Input/Output, Digital Input/Output and temperature measurement connectors. Thus users can easily perform I/O data collecting, status changing, automatically activate events… through the Ethernet network. JetI/O 6500 series provides Windows Utilities, Web and SNMP for configuration. And support Modbus/TCP protocol, OPC Server for Modbus/TCP, thus user can easily monitor and control the remote I/O devices and combine the JetI/O with existed HMI/SCADA package.

Naming Rule: JetI/O 65AB

A: Major Feature

1: Analog Input Series. Includes the RTD input, Thermocouple Input

2: Analog Output Series

3: Digital Input Series

4: Digital Output Series

5: Digital Input and Digital Output Series

B: Sequence Number

JetI/O 6500 Series includes:

JetI/O 6510: Industrial Intelligent 8-CH Analog Input Etherent I/O Server

JetI/O 6511: Industrial Intelligent 8-CH Thermocouple Input Etherent I/O Server

JetI/O 6512: Industrial Intelligent 4-CH RTD Input Etherent I/O Server

JetI/O 6520: Industrial Intelligent 4-CH Analog Output Etherent I/O Server

JetI/O 6550: Industrial Intelligent 14-CH DI and 8-CH DO Etherent I/O Server

The manual apply to above models.

1.2 Major Features

Intelligent Ethernet Block I/O Server

Complete solution with multiple channels Analog Input/Output, Digital Input/Output and temperature measurement (Thermocouple, RTD) features

Accurate measurements with cold junction compensation

Supports PT100, Ni120 RTD and NTC Thermistor

Active alarm for High/Low Voltage/Current/Temperature

Intelligent Conditions&Go (If-Then) logic rules for DI/DO

Support OPC Server Driver

Windows Utiltity, OPC Server Utility, Modbus/TCP protocol, SNMP and Web management

Built-in watchdog timer and real-time clock

Din-Rail Mount with Robust Aluminum case and IP31 protection

1.3 Package Checklist

Korenix JetI/O 6500 Series products are shipped with following items:

- One Ethernet I/O Module
- One attached DIN-Rail clip
- Terminal Blocks for I/O and Power Input
- Documentation and Software CD
- Quick Installation Guide

If any of the above items are missing or damaged, please contact your local sales representative.

1.4 Product Specification

System

CPU: 16 bits/100MHZ, RISC-Based

SDRAM: 32K bytes

Flash ROM: 512K bytes

EEPROM: 256 bytes

Watchdog Timer: 1.0 sec H/W

LED:

PWR: Power Input plugged and On (Red)

RDY: System startup ready (Green)

Network Interface

Ethernet: IEEE 802.3 10Base-T

IEEE 802.3u 100Base-TX

Connector: 1 * RJ-45, Auto MDI/MDI-X

Protection: Built-in 1.5 KV magnetic isolation protection

LED:

Upper (LAN Activity): Orange ON & Blinking

Lower (10M/100M): 10M à Green OFF, 100M à Green ON

PWR: Power On (Green)

RDY: System boot up Ready (Red), system booting (No LED)

Network Protocols: IP, TCP, UDP, SNMP, HTTP, Telnet, BOOTP, DHCP

Digital Input

Input Channels: 14 Channels

Input Type: source type

Input Mode: D/I or event counting with input frequency of 100 Hz max

DC Input: 30V max

Threshold Voltage: 4V

Responding Time to Host PC Request: <2ms

Isolation Voltage: 2500Vrms

Digital Output

Output Channels: 8 Channels

Output Type: SSR output, sink type

Output Mode: Level or pulse output with programmable pulse width

Working Range: 5-40VDC

Driving Capacity: 250mA max

Responding Time to Host PC Request: <2ms

Output Initial State: Programmable

Isolation Voltage: 2500Vrms

Feature

Network Protocols: IP, TCP, UDP, SNMP, HTTP, BOOTP, DHCP, Modbus/TCP, OPC Server

Configuration: Windows Utility, Web browser, SNMP, DHCP Client, TFTP Server for firmware update

Windows Utility: Block I/O Utility, Device Fider Utility

OPC Server Utiltity: OPC Server for Modbus/TCP

SNMP: MIB-II: System, SNMP Trap and Private MIB

SNMP Trap Server: Up to 4 SNMP Trap Server

Logic Condition&Go Rules: Conditions of the DI/Counter values, Actions include DO/Pulse, Counter and Trap

Program: C++ Example code by optional

Power Requirements

System Power: external unregulated +24V (18-32V)

Power Consumption: Max. 1.92W

Mechanical

Dimensions: 120 (H) x 55 (W) x 75 (D)mm

Mounting: Din-Rail

Material: Aluminum

Environmental

Regulatory Approvals: CE, FCC Class A

Operating Temperature: -10 ~ 70°C

Operating Humidity: 20 ~ 90% non-condensing

Storage Temperature: -20 ~ 70°C

Warranty: 3 years

2 Hardware Installation

This chapter includes hardware introduction, installation and configuration information.

Following topics are covered in this chapter:

2.1 Hardware Introduction

Dimension

Appearance

LED Indicators

2.2 Wiring Power Input

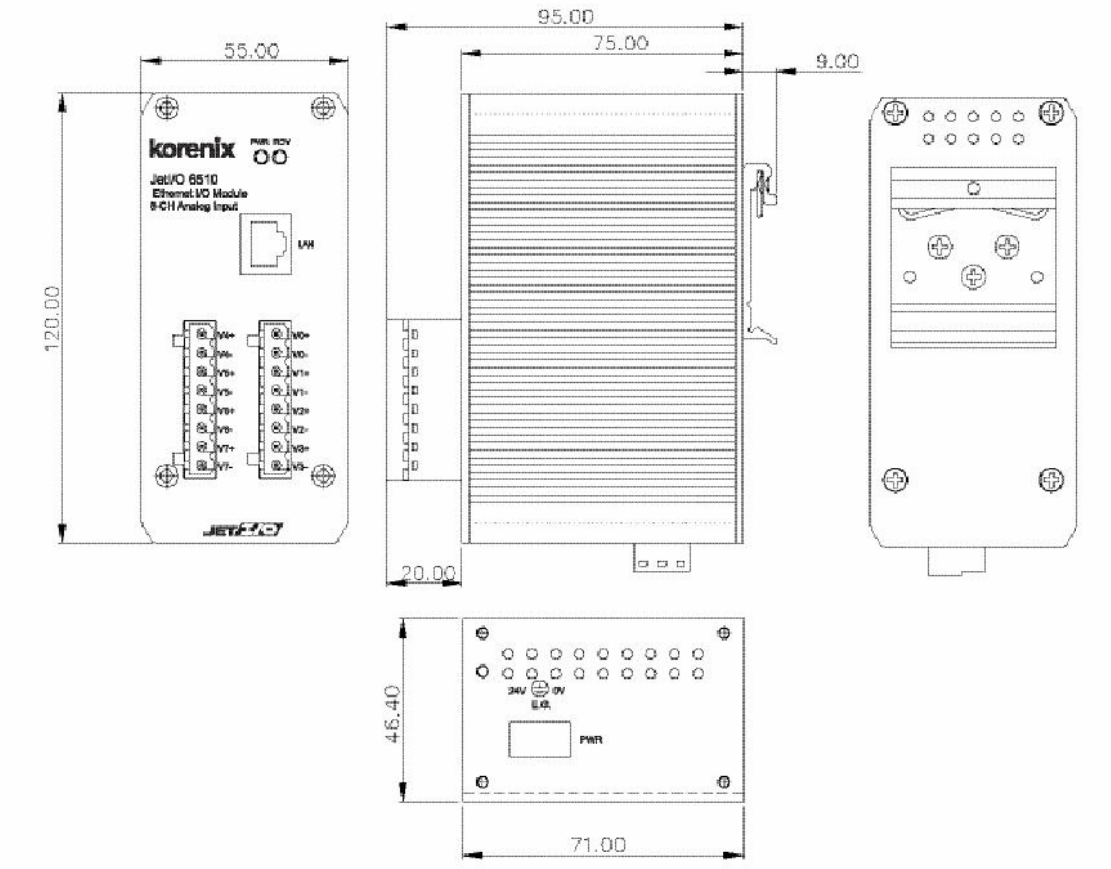
2.3 Wiring Analog/Digital Input/Output

2.4 Wiring Ethernet Ports

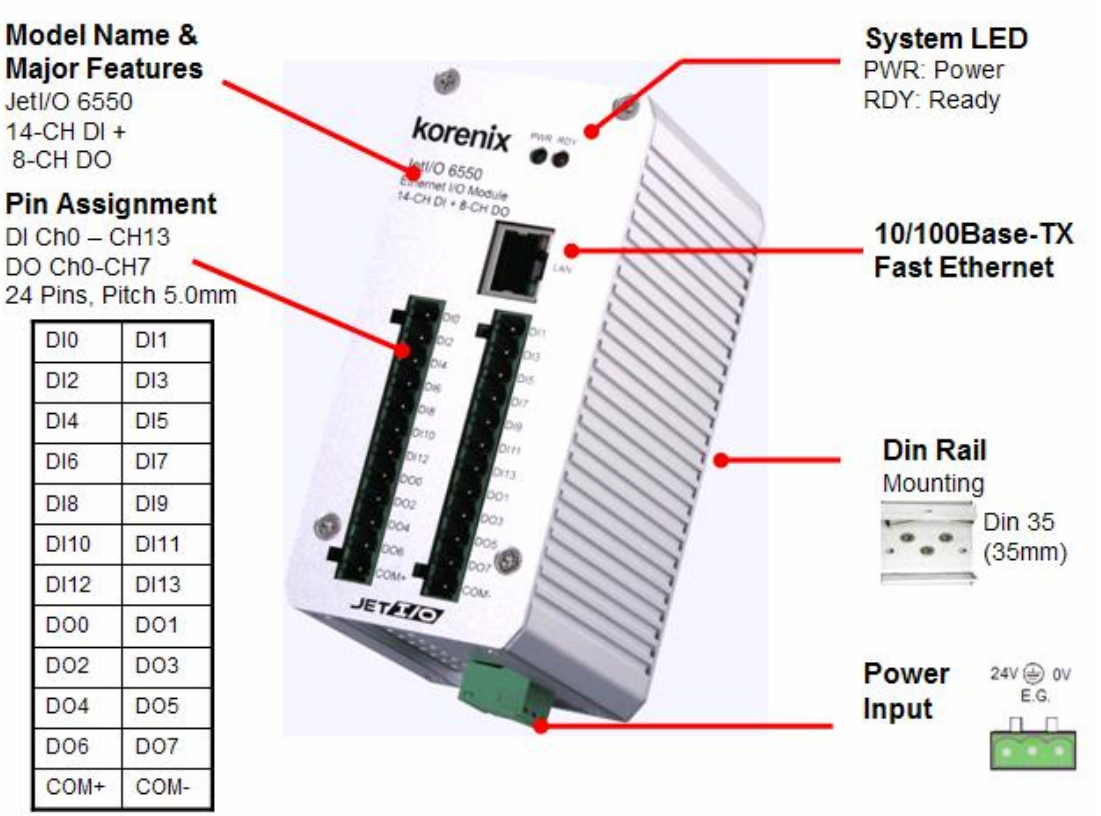
2.5 DIN-Rail Mounting Installation

2.1 Hardware Introduction

Dimensions: 120 (H) x 55 (W) x 75 (D) mm



JetI/O 6550 Appearance:



LED Indicators:

System LED	
PWR	Power Input plugged and On (Green)
RDY	System startup ready (Red)
Ethernet LED	
Upper (LAN Activity)	Orange On & Blinking
Lower(10M/100M)	10M (Green Off) /100M(Green ON

2.2 Wiring Power Input

Follow below steps to wire JetI/O DC power inputs.

1. Follow the pin assignment to insert the wires into the contacts on the terminal block connector.
2. Tighten the wire-clamp screws to prevent DC wires from being loosened.
3. Connect to and turn on the power source. The suitable working voltage is 24VDC.
4. When the unit is ready, the PWR LED turns Greed, the RDY LED turns Red.

Note1: It is a good practice to turn off input and load power, and to unplug power terminal block before making wire connections. Otherwise, your screwdriver blade can inadvertently short your terminal connections to the grounded enclosure.

Note 2: The range of the suitable electric wire is from 12 to 24 AWG.

2.3 Wiring I/O Connectors

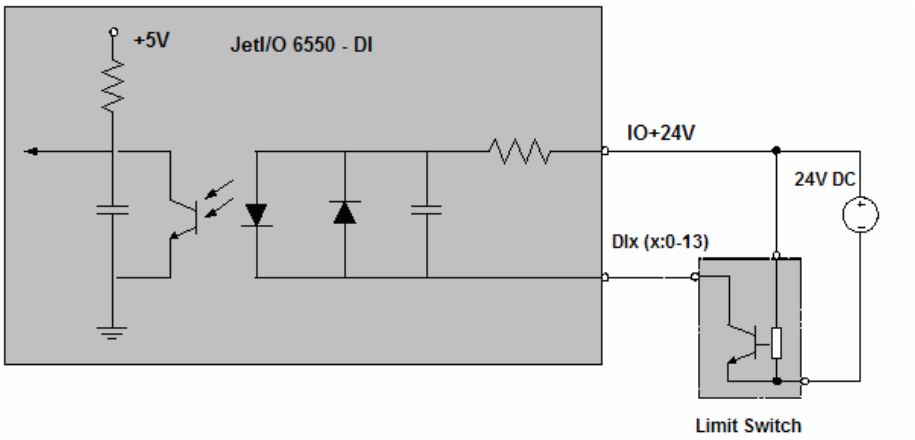
Follow the pin assignment to insert the wires into the front contacts on the terminal block connector. Tighten the wire-clamp screws to prevent the I/O wires from being loosened.

The wiring diagram of the JetI/O 6510 is as below:

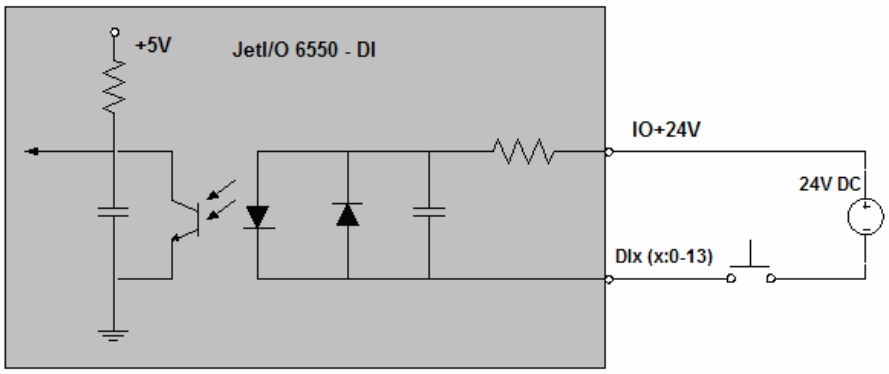
Pin No	Description	Pin No	Description
1(DI0)	Digital input Ch0	13(DI1)	Digital input Ch1
2(DI2)	Digital input Ch2	14(DI3)	Digital input Ch3
3(DI4)	Digital input Ch4	15(DI5)	Digital input Ch5
4(DI6)	Digital input Ch6	16(DI7)	Digital input Ch7
5(DI8)	Digital input Ch8	17(DI9)	Digital input Ch9
6(DI10)	Digital input Ch10	18(DI11)	Digital input Ch11
7(DI12)	Digital input Ch12	19(DI13)	Digital input Ch13
8(DO0)	Digital Output 0	20(DO1)	Digital Output 1
9(DO2)	Digital Output 2	21(DO3)	Digital Output 3
10(DO4)	Digital Output 4	22(DO5)	Digital Output 5
11(DO6)	Digital Output 6	23(DO7)	Digital Output 7
12(COM+)	IO Power--COM+	24(COM-)	IO Power--COM-

2.4 JetI/O 6550 Wiring Example

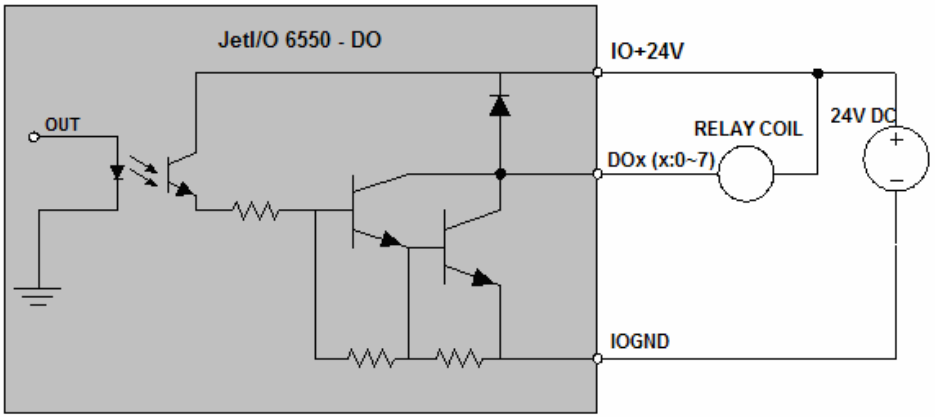
2.4.1 JetI/O 6550 Digital Input Wiring Example (Limit Switch)



2.4.2 JetI/O 6550 Digital Input Wiring Example (Push Button)



2.4.3 JetI/O 6550 Digital Input Wiring Example (Push Button)



2.5 Wiring Earth Ground

To ensure the system will not be damaged by noise or any electrical shock, we suggest you to make exact connection with JetI/O products with Earth Ground.

On the bottom side of JetI/O 6500 Series, there is one power earth ground pin in the Power Input terminal block.

Pin No	Description
1(+24V)	DC+24V Power Input
2(FGND)	Power Earth Ground
3(0V)	Referenced Ground for Power Input

2.6 Wiring Fast Ethernet Ports

JetI/O 6500 series includes 1 RJ45 Fast Ethernet ports. The fast Ethernet ports support 10Base-T and 100Base-TX, full or half duplex modes. The fast Ethernet port will auto-detect the signal from connected devices to negotiate the link speed and duplex mode. Auto MDI/MDIX allows users to connect another switch, hub or workstation without changing straight through or crossover cables.

Connect one side of an Ethernet cable into the Ethernet port and connect the other side to the attached switch or host. The link LED will light up when the cable is correctly connected. Refer to the **LED Indicators** section for descriptions of each LED indicator. Always make sure that the cables length between the 2 ends is less than 100 meters (328 feet).

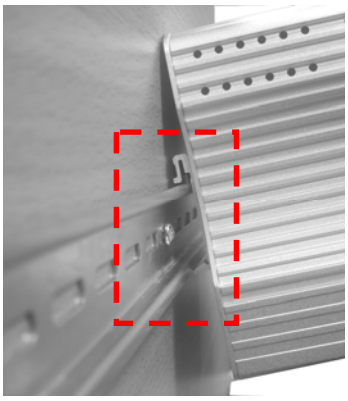
The wiring cable types are as below.

10Base-T: 2-pair UTP/STP Cat. 3, 4, 5 cable, EIA/TIA-568 100-ohm (100m)
100 Base-TX: 2-pair UTP/STP Cat. 5 cable, EIA/TIA-568 100-ohm (100m)
1000 Base-TX: 4-pair UTP/STP Cat. 5 cable, EIA/TIA-568 100-ohm (100m)

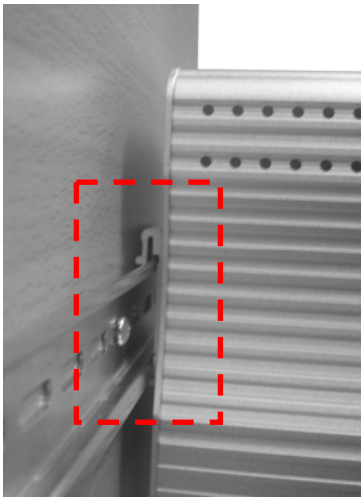
2.7 Din-Rail Mounting Installation

The DIN-Rail clip is already attached to the JetI/O 6500 Series when packaged. If the DIN-Rail clip is not screwed on the JetI/O, follow the instructions and the figure below to attach DIN-Rail clip to JetI/O.

a. Insert the upper end of DIN-Rail clip into the back of DIN-Rail track from its upper side.



b. Lightly push the bottom of DIN-Rail clip into the track.



c. Check if DIN-Rail clip is tightly attached on the track.
d. To remove JetI/O Server from the track, reverse the steps above.

3 Preparation for Management

Before you start to configure the JetI/O, you need to know the system architecture of the JetI/O products, configure the device's IP address, and then you can remotely manage the Ethernet I/O via the network. This chapter introduces the basic knowledge of the related technologies.

Following topics are covered in this chapter:

3.1 Understand the Ethernet I/O Architecture

3.2 Preparation for Remote Management

3.3 Preparation for HMI/SCADA Integration

4.1 Understand the Ethernet I/O Architecture

The Figure 1 shows the JetI/O Intelligent Ethernet I/O Server Architecrure. In the top level shows the typical applications run in the remote I/O environment. The middle level is the Etherent infrasture. The low level, gray block include the software agent, signal types of the JetI/O 6500 series intelligent Etherent I/O Server.

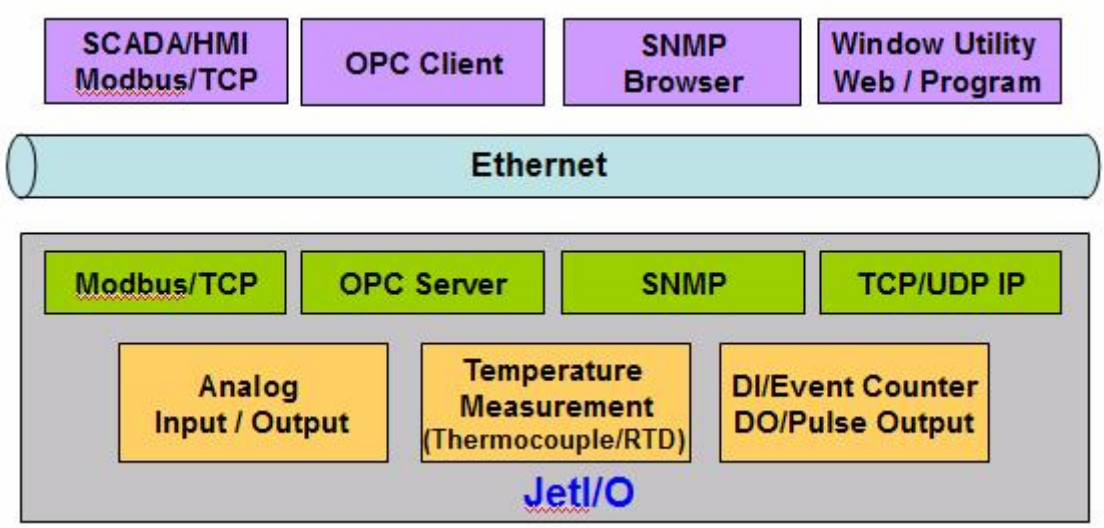


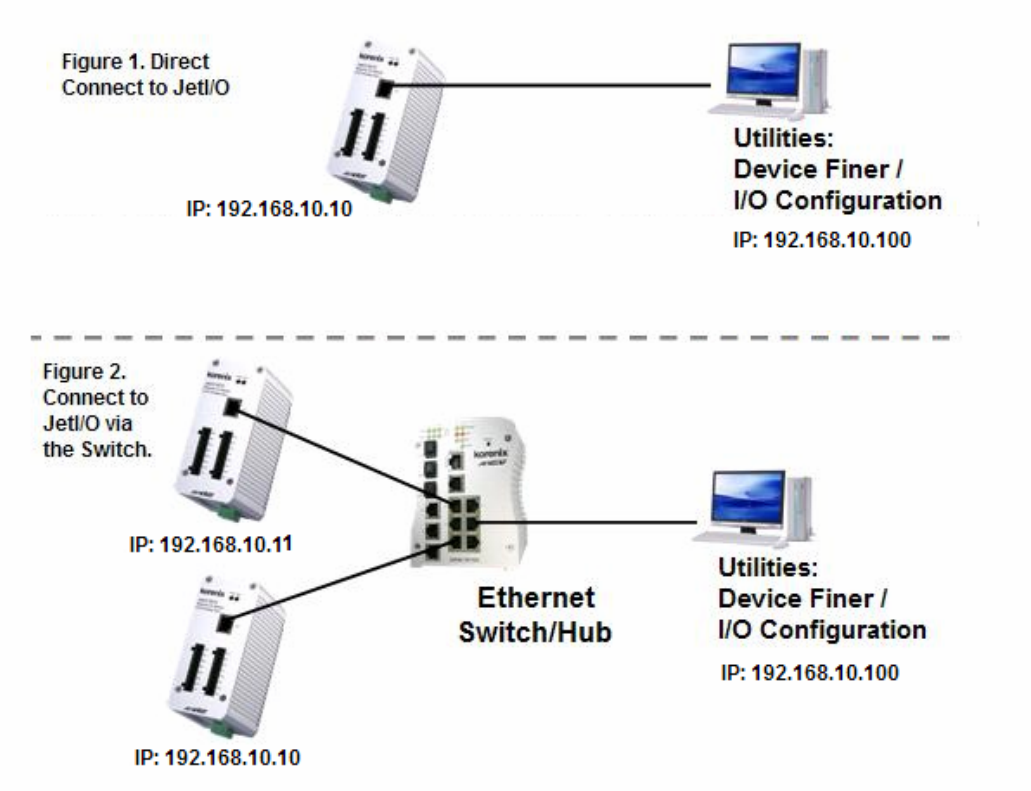
Figure 1. The JetI/O Intelligent Ethernet I/O Server Architecrure.

4.2 Preparation for Remote Management

JetI/O 6500 series Intelligent I/O Server provides several types remote management methods. You can configure the JetI/O via the Etherent network. You just need to know the device's IP address and then you can remotely control or monitor the I/O channels' information.

JetI/O provides several ways for users to configure the IP address. The default IP address is 192.168.10.3. You can directly connect the JetI/O one after one to change its

IP address. Or connect the JetI/Os to the same switch or network, then the host PC can modify the IP address via the switch or network.



If you purchase several JetI/Os and connect them to the same network before change their IP address. They must have the same default IP address, and you may not control them well due to the IP conflict. At this time, you should change their IP address first. The JetI/O' Block I/O configuration utility or Device Finder Utility can help you to do this.

Note 1: Device Finder Utility allows you to discover the JetI/Os which have the same IP address. Change the IP address of the JetI/O one after one. After you configured the new IP address for the unit, please notice whether the ARP table of the device is flashed or not. If not, you can choose "Start -> Run", type "cmd" to open the DOS prompt. Use "arp –d" to clear the ARP cache.

Note 2: You can find the detail progress, please refer to the next chapters.

4 Feature Configuration

JetI/O 6500 series Industrial Managed Ethernet I/O module provides several configuration methods. This chapter introduces the configuration steps.

Following topics are covered in this chapter:

4.1 Block I/O Configuration Utility

4.2 Block I/O OPC Server Utility

4.3 Device Finder Utility

4.4 SNMP

4.5 Web UI

4.6 Modbus/TCP Command set

4.6.1 Introduction of Modbus/TCP protocol

4.6.2 JetI/O 6510 Modbus/TCP command set

4.1 Block I/O Configuration Utility

Block I/O Utility is the major JetI/O Configuration Utility. With this tool, you can browse the available units, view the status of each channels, configure the I/O settings, configure active alarms and conditions&Go logic rule.

4.1.1 Installation

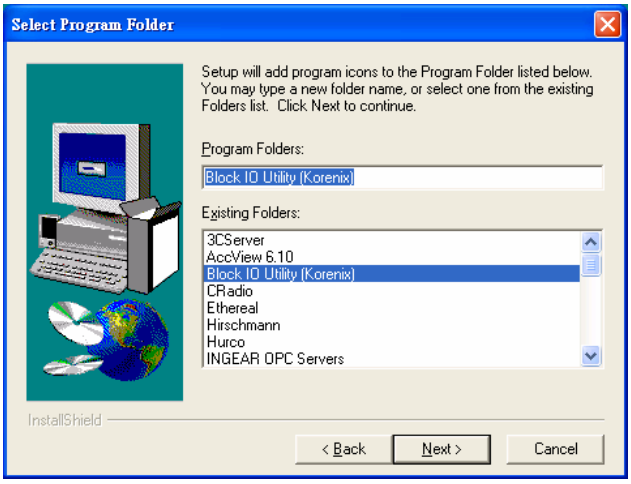
1. Go to the “Utility -> IO Configuration” folder. Click “Setup.exe” to run the setup progress.

Welcome
Welcome to the Block IO Utility (Korenix) Setup program. This program will install Block IO Utility (Korenix) on your computer.
It is strongly recommended that you exit all Windows programs before running this Setup program.
Click Cancel to quit Setup and then close any programs you have running. Click Next to continue with the Setup program.
WARNING: This program is protected by copyright law and international treaties.
Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.
InstallShield
< Back
Next >
Cancel

2. Click “Next” and type the Name and Company in the “User Information” window. Then click “Next”.

3. Choose the Destination Directory in the “Choose Installation Location” window. Then click “Next”.

4. Type the name for the Block I/O Configuration Utility or use the default name, Block IO Utility (Korenix) for the program in the “Program Folder” field of the “Select Program Folder” window. Then click “Next”.

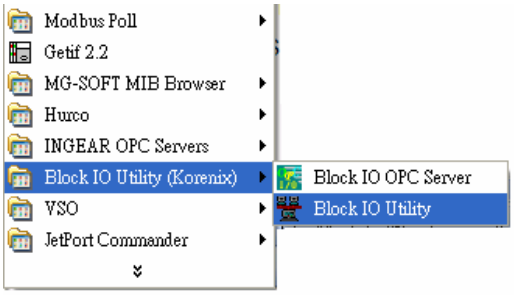


5. Click “Next” in the “Starting Copying File” window to continue the setup progress.

6. As long as you see the “Setup Complete” window that means the progress is finished. Click “Finish” to exit the setup progress.

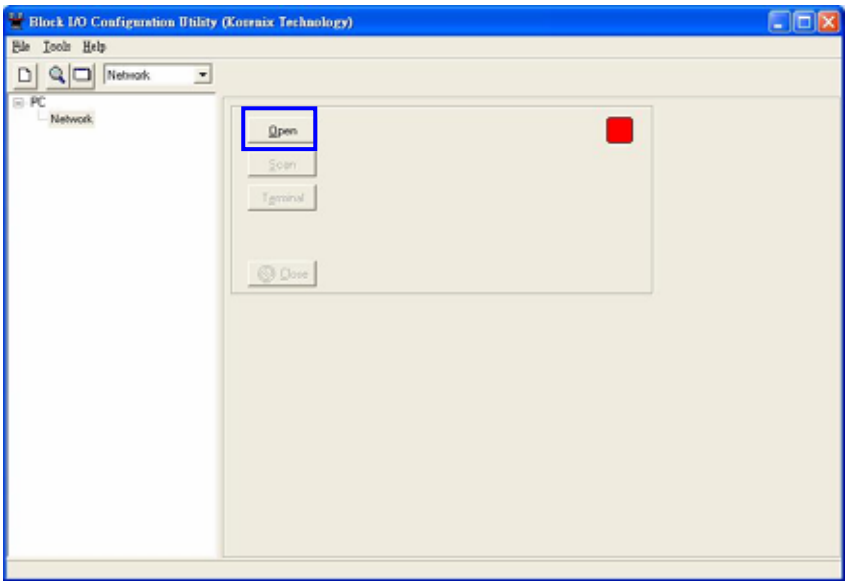
Setup Complete
Setup has finished installing the application on your computer.
You may launch the application by selecting the icons installed.
Click Finish to complete Setup.
InstallShield
< Back
Finish

7. Go to “Start” -> “Program”, then you can see the “Block IO Utility(Korenix) folder. There are 2 utilities are installed, Block IO OPC Server and Block IO Utility.

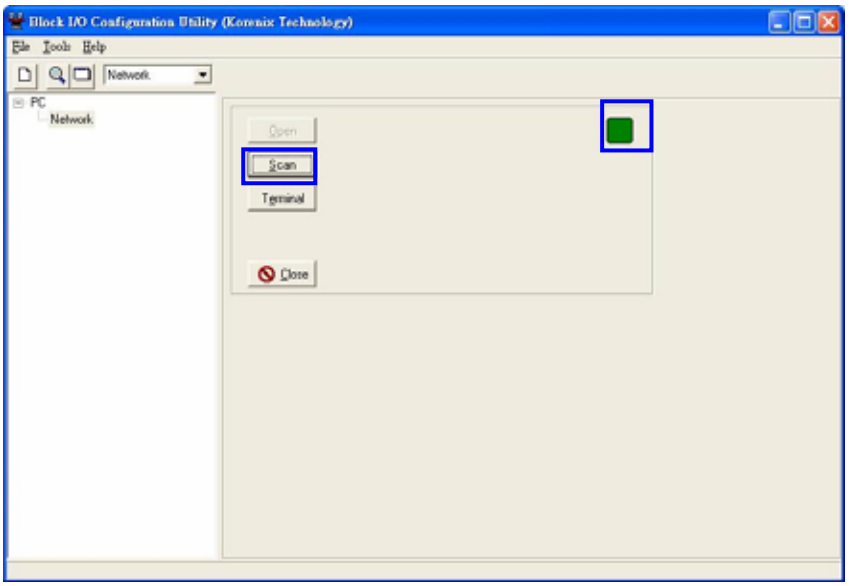


4.1.2 Device Scan

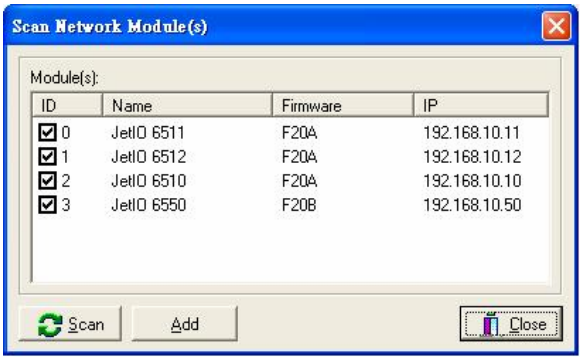
1. Lunch the Block IO Utility and then press “Open” to enable the network Interface.



The right indicator will show “Green” after you opened the interface. Click “Cloos” can close the network interface.

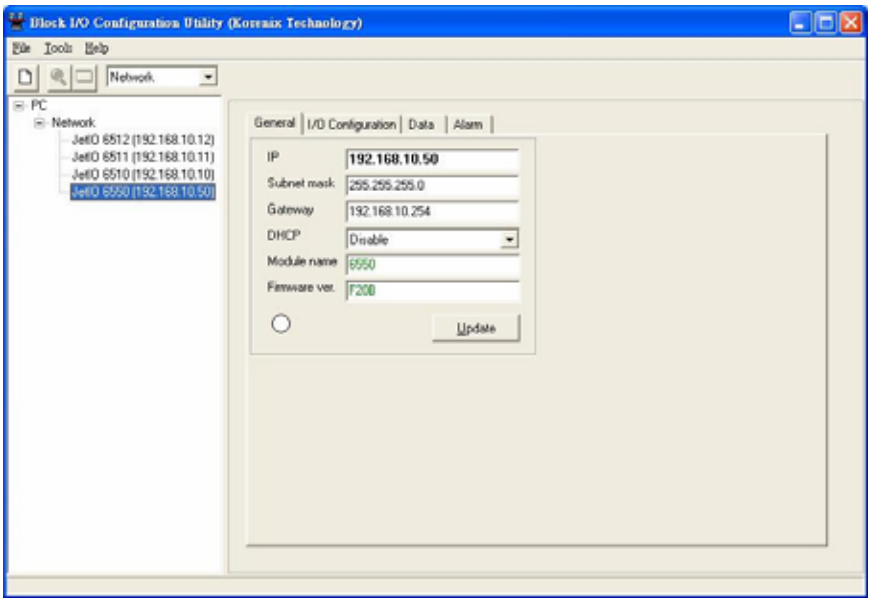


2. Click “Scan” to open the “Scan Network Module(s)” popup window. Click Scan to start the searching.



Note: Please modify the IP address of your target devices. The scan feature can't browse the devices which have the same IP address. Only one of the devices which have the same IP address can be found. This is the current restriction. Please modify the IP address first. You can use web browser, Block I/O Utility or Device Finder to do the IP modification.

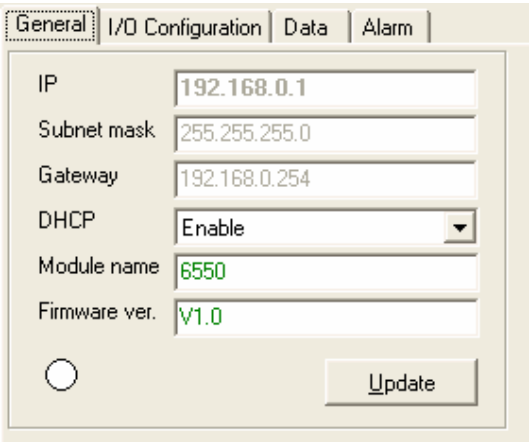
3. Click "Add" to add the available JetI/O units. Then you can see the JetI/O units are listed in the left column.



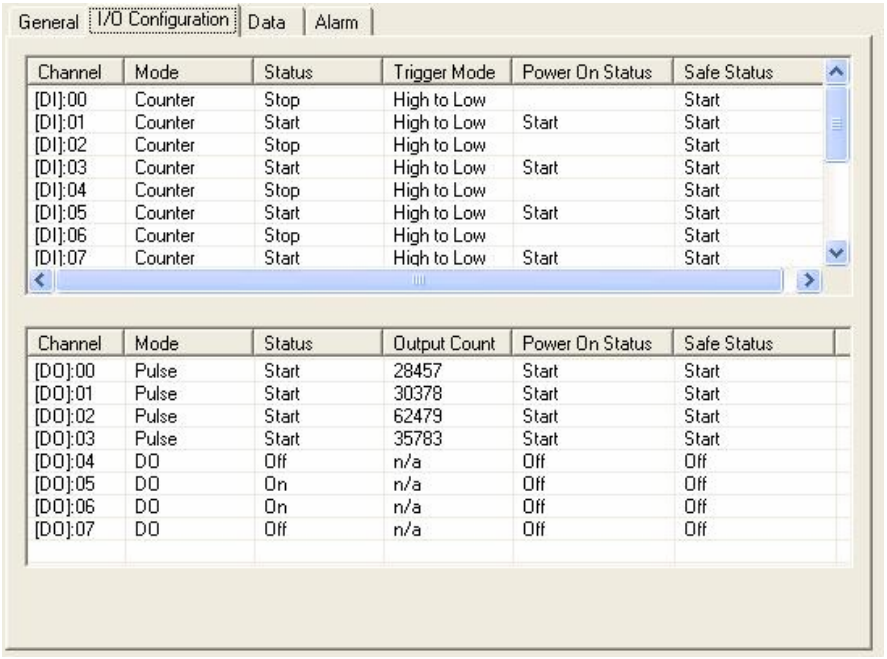
4. Move the mouse over to one of the JetI/O units. Select the unit then you can configure and monitor the configurations of the JetI/O. The features Block I/O Configuration utility provide are similar, please find your model name and go to its configuration introduction chapter in below.

4.1.3 JetI/O 6550 Configuration

4.1.3.1 Go to **"General"** page. You can view the current settings, modify the IP address, Subnet mask, Default Gateway, Enable or Disable DHCP Client mode and check the Firmware version. After modified the network setting, press "Update" to active the new setting. The indicator will show green when update successfully.

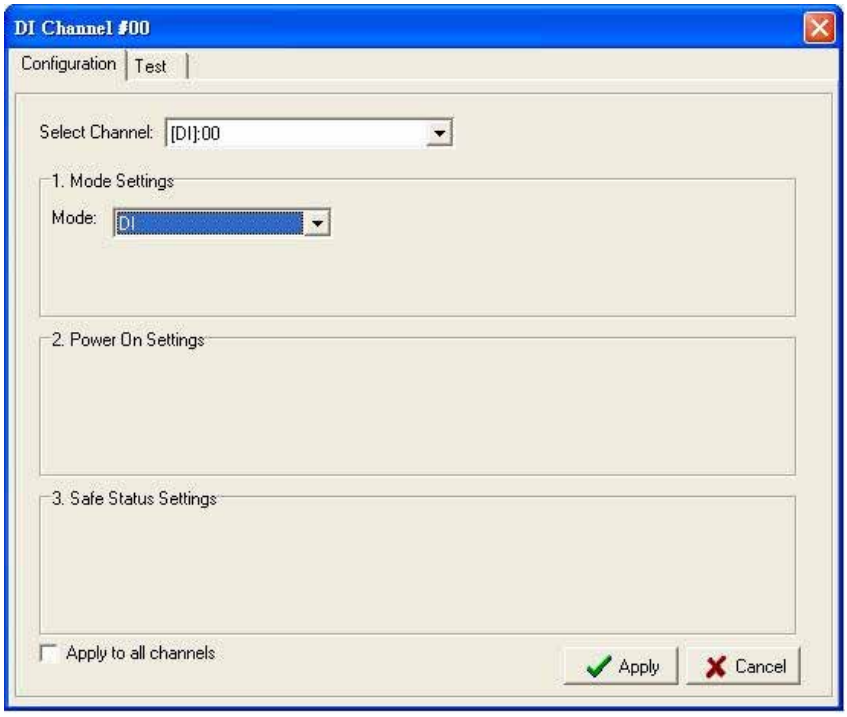


4.1.3.2 Go to “**I/O Configuration**” page. You can configure the DI/DO mode, check status for each channel.


General
I/O Configuration
Data
Alarm
Channel Mode Status Trigger Mode Power On Status Safe Status
[DI]:00 Counter Stop High to Low Start
[DI]:01 Counter Start High to Low Start Start
[DI]:02 Counter Stop High to Low Start
[DI]:03 Counter Start High to Low Start Start
[DI]:04 Counter Stop High to Low Start
[DI]:05 Counter Start High to Low Start Start
[DI]:06 Counter Stop High to Low Start
[DI]:07 Counter Start High to Low Start Start
Channel Mode Status Output Count Power On Status Safe Status
[DO]:00 Pulse Start 28457 Start Start
[DO]:01 Pulse Start 30378 Start Start
[DO]:02 Pulse Start 62479 Start Start
[DO]:03 Pulse Start 35783 Start Start
[DO]:04 DO Off n/a Off Off
[DO]:05 DO On n/a Off Off
[DO]:06 DO On n/a Off Off
[DO]:07 DO Off n/a Off Off

Select the entry of the DI channel you want configure and double click. The below popup window of the DI Channel’s setting appears.

DI Channel Configuration – DI (Digital Input):



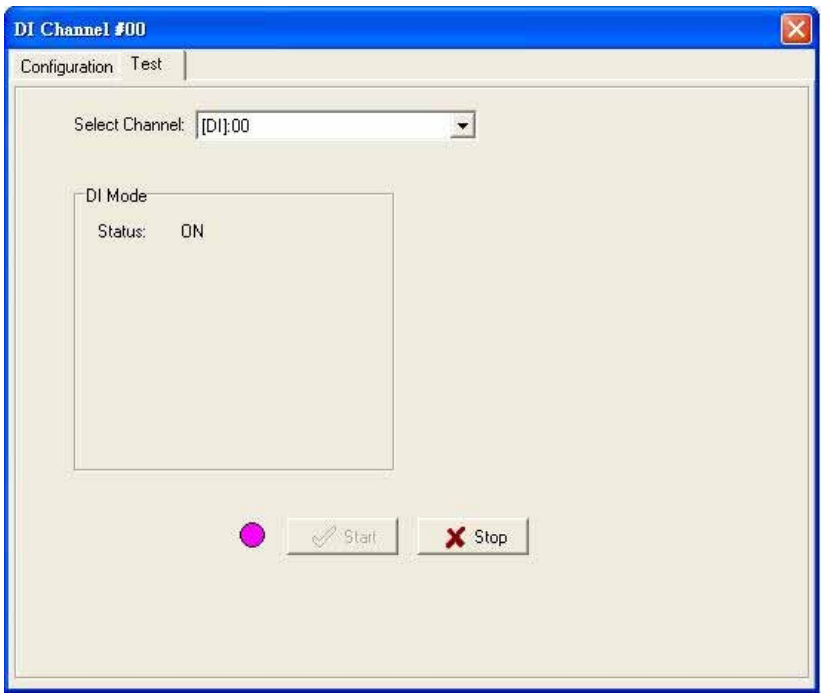
Select Channel: [DI]:00 ~ [DI]13 or Select “Apply to all channels”

Model Settings: Mode: DI

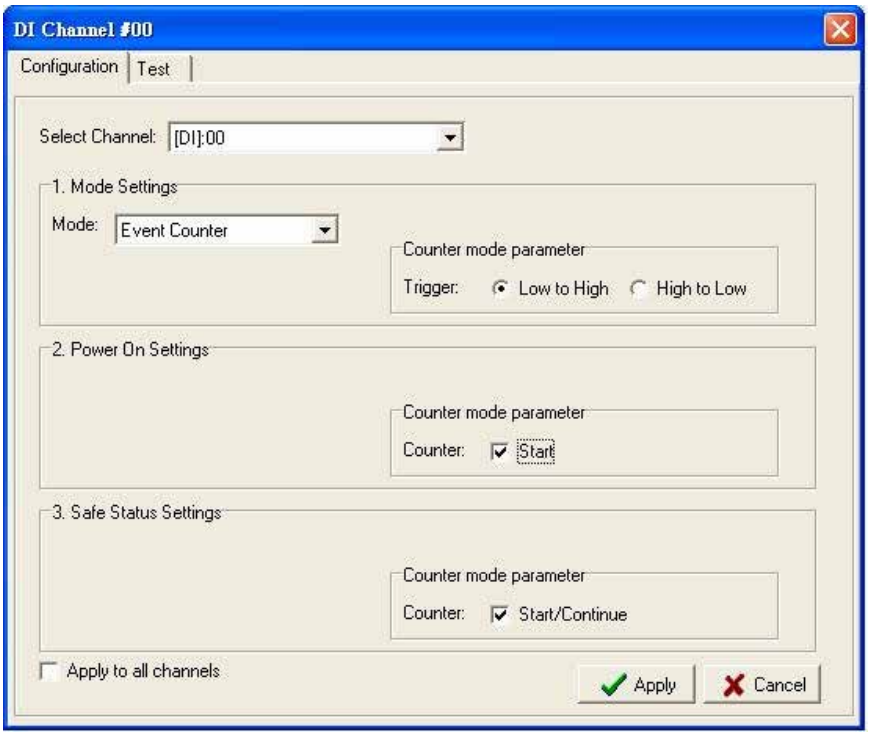
Press “Apply” to assign the mode for the channel.

DI Channel Test – DI (Digital Input):

Select the target channel and press “Start” to monitor the status of the DI mode.



DI Channel Configuration – Event Counter:



Select Channel: [DI]:00 ~ [DI]13

Select one of the channels or select “Apply to all channels”.

1. Model Settings: Mode: Event Counter

Counter mode parameter: “Low to High” or “High to Low”

2. Power On Settings: Start or Disable

   Enable Power On selection to automatically count the events when startup the I/O Server.

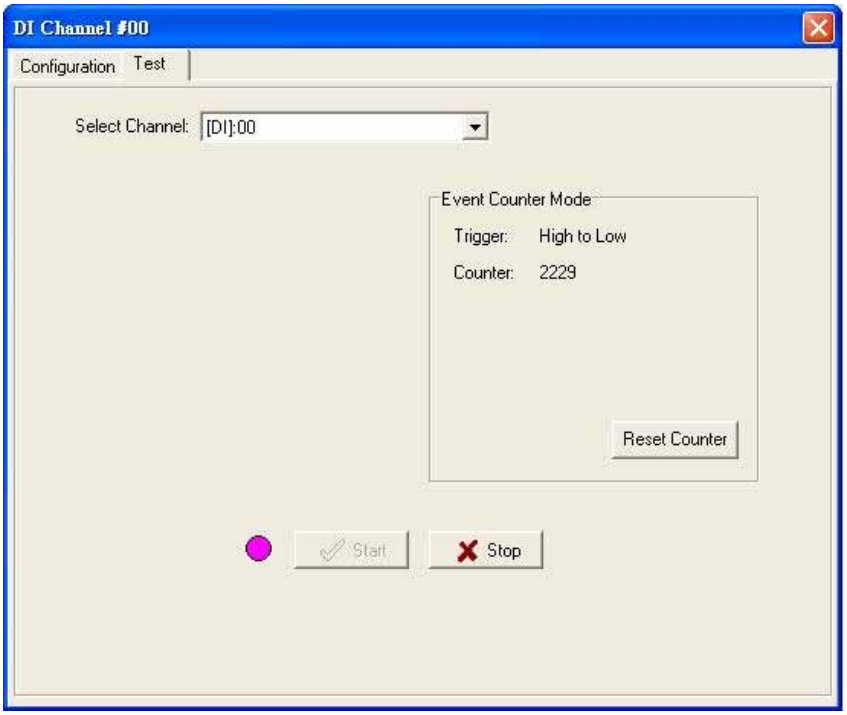
3. Safe Status Settings: Start/Continus or Disable

   Enable Safe Status selection to keep counting the events when disconnected the LAN interface. .

Press “Apply” to assign the mode for the channel.

DI Channel Test – Event Counter:

Select the target channel and press “Start” to monitor the counter of the Event Counter mode. Press “Reset Counter” can reset the counter to zero.

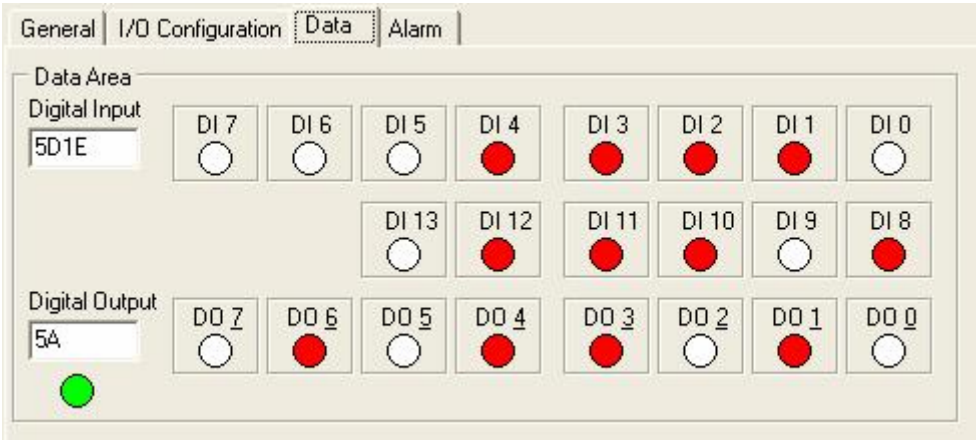


4.1.3.3 Go to **“Data”** page. You can monitor the current working voltage of each channel.

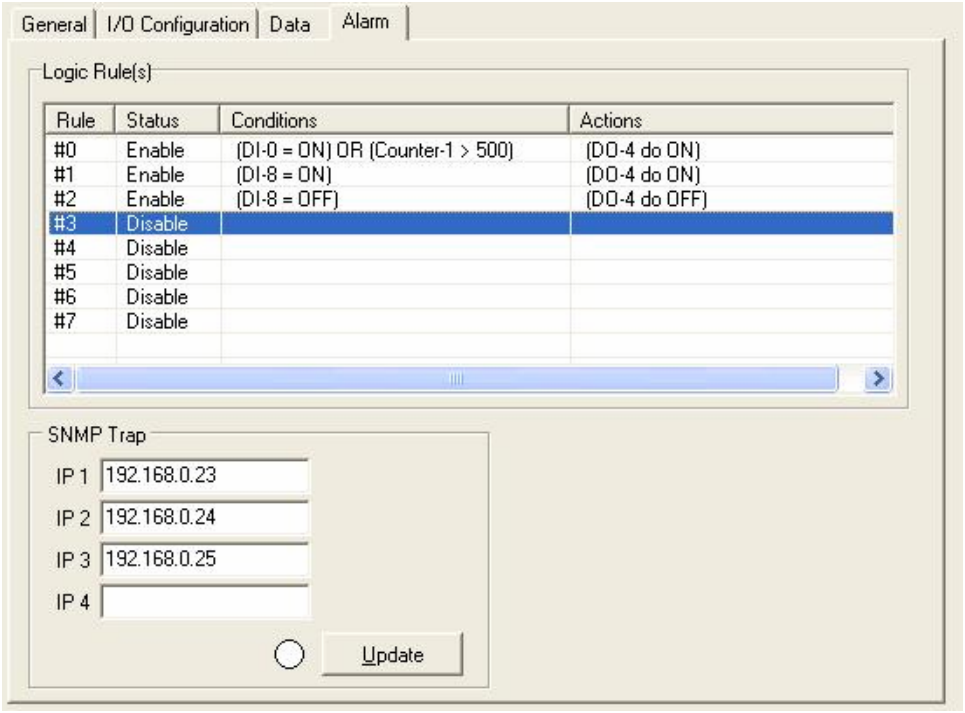
Check Box	Select the check box to monitor the info of the channel. Unselect the check box when you don’t want to monitor it.
White	Afte enabled the alarm feature of the channel, these is a white circle behind the channel.
Red	The circle become to Red when the alarm is activated.
Blinking	The indicator in the bottom of the Data Area means the utility is monitoring the status of the channels. If there is error occurred, the color become to red or not light.

The DI status allows you to read the On/Off Status of the DI channels.

The DO status allows you to read and change the On/Off status of the DO channels.



4.1.3.4 Go to **"Alarm"** page. You can configure the "**Condition & Go"** logic rules and active alarm for each channel.



The "**Condition & Go"** logic rule provides one-time operation in each entry. The theory is the same as the "IF-Then" rule. If the "Conditions" is reached, then automatically activate the "Actions". For example:

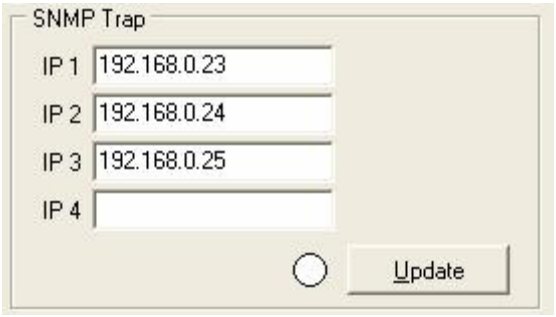
Rule	Status	Condition	Action
#1	Enable	DI0 = ON	DO0 = ON
#2	Enable	DI0 = OFF	DO0 = OFF

Rule # 1: If condition is equal to "DI0=ON", the "DO 0" is automatically "ON". Should you want to run the reverse behavior, configure the reverse way in the rule #2.

The maximun "Condition&Go"logic rules 6550 support is 8. Each rule can support up to 4 different conditions and 4 different actions. The supported conditions and actions are as below:

Condition		Action	
DI - Channel	ON, OFF, ON to OFF, OFF to ON	DO - Channel	ON, OFF
Event Counter -Channel	=, >, <, ≦, ≧	Event Counter – Channel	Reset
Counter Value	(number)	Pulse Output	Start or Stop
Relation between Conditions	OR or AND	SNMP	(Trap Server IP)

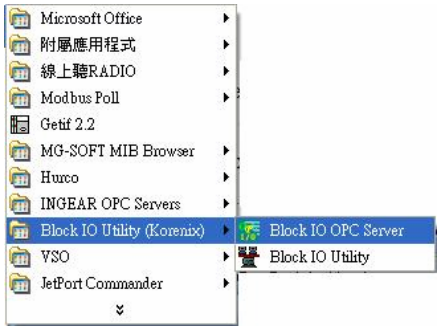
SNMP Trap Server Setting: You can configure up to 4 SNMP Trap Server here. Type the IP address and press “Update” to activate the new setting.



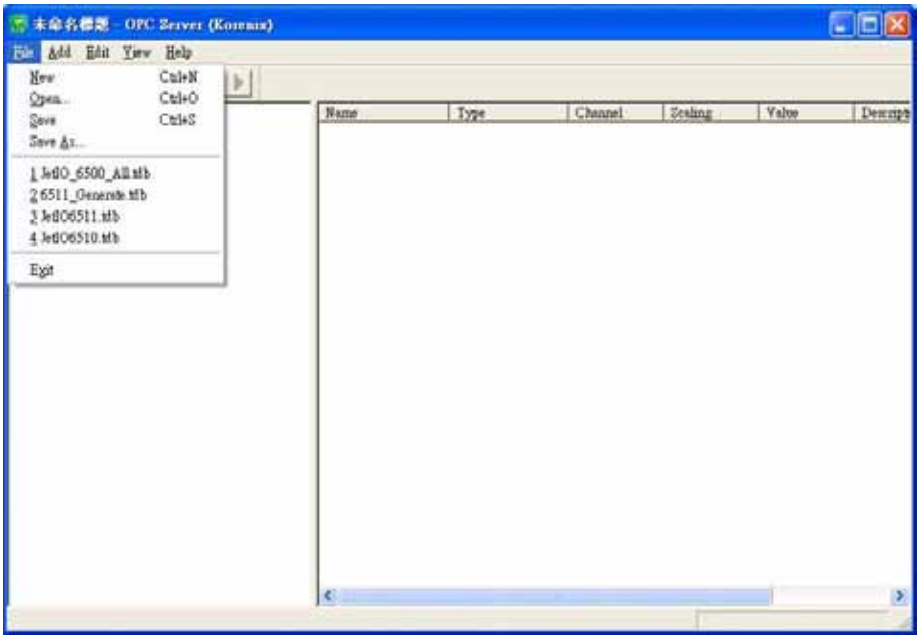
4.2 Block I/O OPC Server Utility

4.2.1 OPC Server Utility

1. Go to “Start” -> “Program”, and then you can see the “Block IO Utility (Korenix) folder. There are 2 utilities are installed, Block IO OPC Server and Block IO Utility.



2. Open the “Block IO OPC Server”.
3. Select “File -> New” to create new profile. Or select “File -> Open” to open profile you saved.



4. Select “Add -> New Device”, the popup window “Driver Selection” will appear. (Only appear in the first time you add new device). Click “Add” and type the driver name and correct IP address. Click “OK” to next popup windows for Driver Selection. Use “Edit -> Comm Setting” can modify the parameters.

Figure 4.1 “Add” the “New Device”.

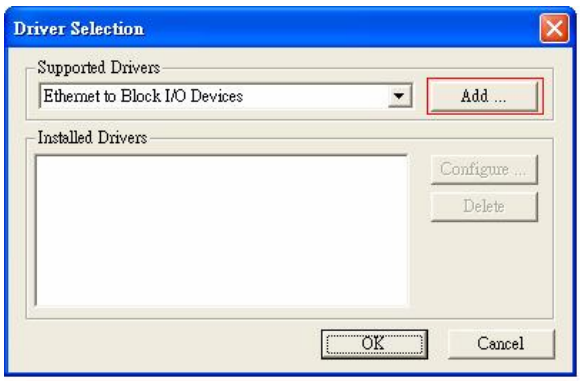


Figure 4.2 Installed Driver Selection Window.

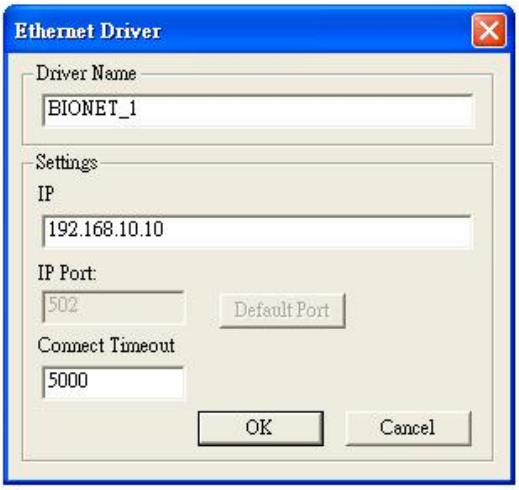
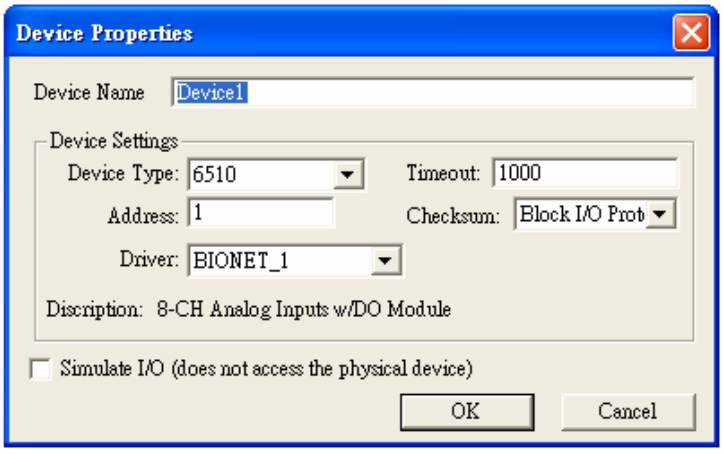
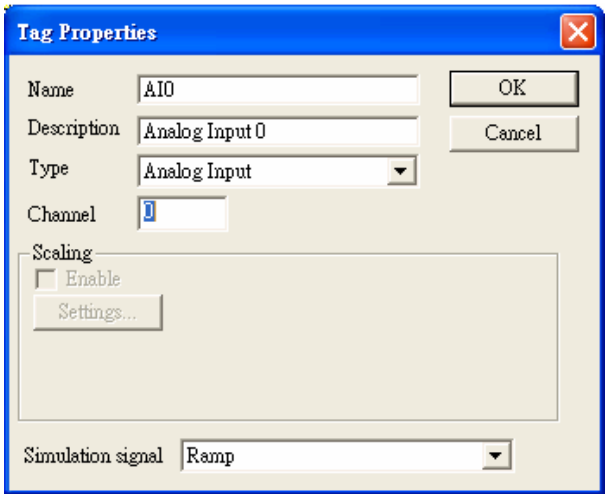


Figure 4.3 “Ethernet Driver” for the devices.

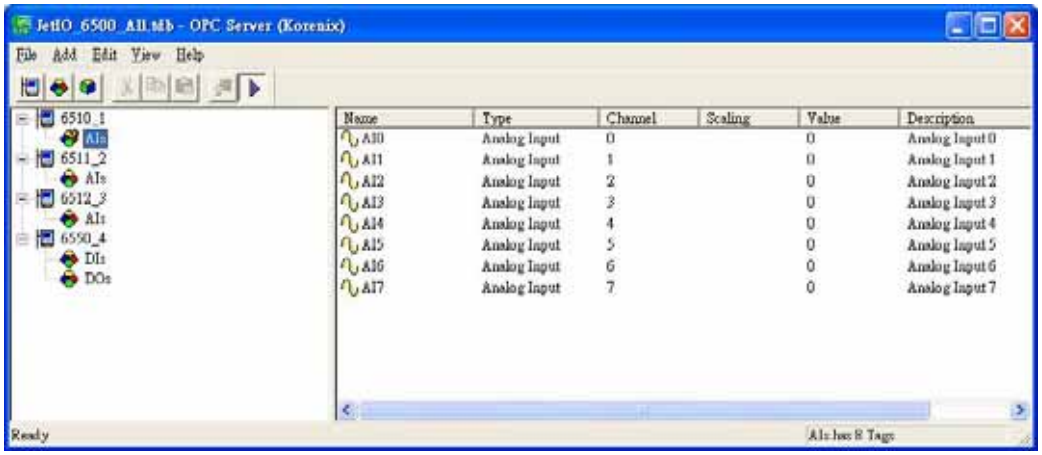
5. Type the “Device Name” and select the “Device Type” in the “Device Configuration” window.



6. Select “Add -> New Group” to create new group for the later new tags you’ll create. Select “Add -> New Tag” and fill the “Tag Properties” in the popup window. Select the tag and “Edit –> Properties“, you can modify the tag properties.



7. Select “Add -> Generate Tags”, the utility generate all the channels’ tags for the device.


JetIO_6500_All.Mb - OPC Server (Korenix)
File Add Edit View Help
6510_1
AIs
6511_2
AIs
6512_3
AIs
6550_4
DIs
DOs
Name Type Channel Scaling Value Description
AI0 Analog Input 0 0 Analog Input 0
AI1 Analog Input 1 0 Analog Input 1
AI2 Analog Input 2 0 Analog Input 2
AI3 Analog Input 3 0 Analog Input 3
AI4 Analog Input 4 0 Analog Input 4
AI5 Analog Input 5 0 Analog Input 5
AI6 Analog Input 6 0 Analog Input 6
AI7 Analog Input 7 0 Analog Input 7
Ready

Name: The name of the channel. You can manually change this value.

Type: The input type of the channel.

Channel: The channel ID.

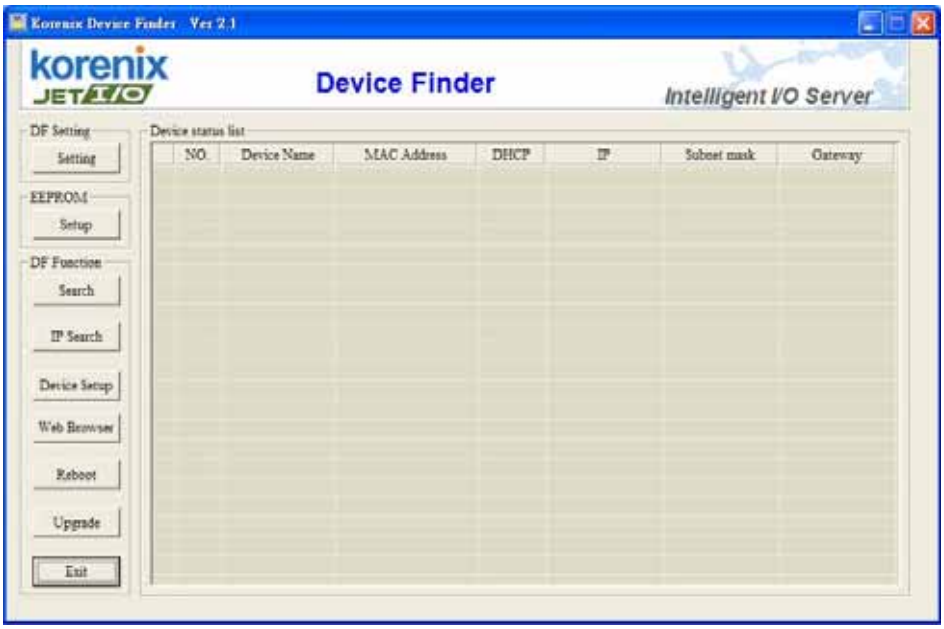
Value: The value of the channel, you can use “Monitor” to read them.

Description: The description of this channel, you can munually change this value.

8. Select “View -> Monitor” to monitor the status of the tags. Or you can click the Monitor icon in the UI.
9. Select “File -> Save” to save the profile, then your OPC Client can monitor the Jet I/O status.

4.3 Device Finder Utility

1. Go to the “Utility -> Device Finder” folder. Click “DeviceFinder.exe” to run the program.



2. Click “Setting” of the DF Setting, you can configure the polling period time.
3. Click “Setup” of the EEPROM, you can see the info of the device. It’s good to do debugging.
4. Click “Search”, Device Finder can automatically search the JetI/Os.

5. Click “IP Search” to search one specific IP address.
6. Click “Device Setup” to configure the IP address… basic network settings.
7. Click “Web Browser” to connect the web UI of the device.
8. Click “Reboot” to reboot the device.
9. Click “Upgrade” to upload the new firmware.
10. Click “Exit” to exit the program.

4.4 SNMP

Simple Network Management Protocol (SNMP) is a protocol used for exchanging management information between network devices. SNMP is a member of the TCP/IP protocol suite. JetI/O 6500 series support SNMP v1 and v2c.

An SNMP managed network consists of two main components: agents and a manager. An agent is a management software module that resides in a managed switch. An agent translates the local management information from the managed device into a SNMP compatible format. The manager is the console through the network.

JetI/O 6500 series supports Public MIB: System. Private MIB includes channels’ information. SNMP Trap allows the JetI/O to send the active alarm to trap servers.

4.5 Web UI

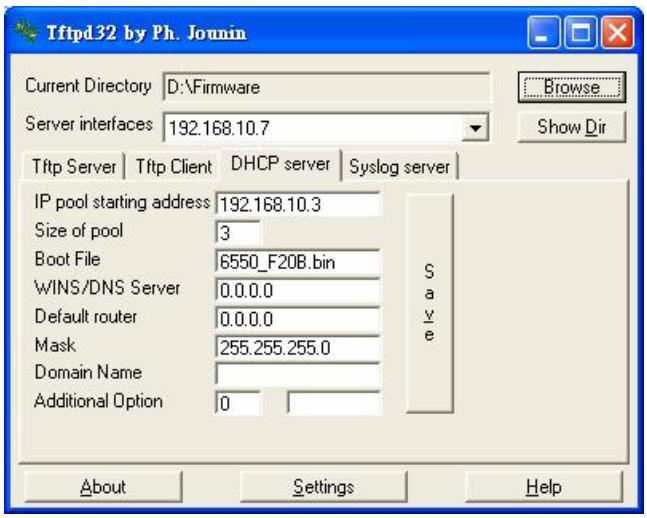
Type the IP address of the device. Then you can access the embedded web browser of the I/O server. The web browser allows you monitor the information/status of each channels.

4.6 How to Upgrade Firmware

The JetI/O server allows you remotely upgrade the firmware to fix the known issues or to enhance the software features. When user starts the progress of the firmware upgrade, the JetI/O runs as the DHCP client mode to get the IP from DHCP Server and download the boot file from the server. (Not the same as JetNet or other product.)

For JetI/O firmware upgrading utility, we recommend the freeware utility, **TFTP32.** You can easily download the tool in the web site: **http://tftpd32.jounin.net/**

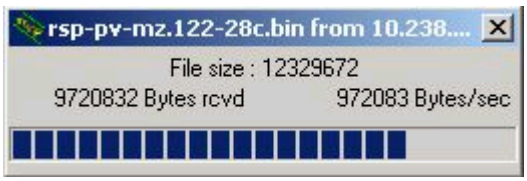
1. Download the file and run it first.
2. Browse the “Current Directory” of the firmware file you put. And select the network interface card you used.
3. Configure the setting in the “DHCP Server” mode.
   a. Type the start IP address in the “IP pool starting address”.
   b. Type the volume for the Size of the pool. The volume is the IP address the DHCP Server can assign to the clients.
   c. Boot File: Type the file name you want update.
   d. Mask: Type the subnet mask here.
   e. The other settings are optional, depend on your environment.



   f. After configured, press “Save” to save the settings.

4. Open the Device Finder Utility and search the available JetI/O servers. Select the

target unit/units you want upgrade. Then press “Upgrade” to start the progress. The JetI/O can get dynamic IP and download file from the TFTP32. The popup window shows you the upgrading progress in TFTP32.



5. After firmware file downloading finished. The JetI/O server’s firmware can be upgraded automatically.
6. Open the Block I/O Configuration utility and check the firmware in “General” page.

5 Modbus/TCP Command Set

This chapter introduces the Modbus/TCP command set JetI/O provided. When you creating application for your SCADA/HMI or coding your own programs. The command set is helpful for you to find the value of each registers.

Following topics are covered in this chapter:

5.1 Introduction of Modbus/TCP Protocol

5.2 JetI/O 6510 Modbus/TCP Address Mapping

5.1 Introduction of Modbus/TCP Protocol

5.1.1 Modbus/TCP Protocol

The Modbus protocol, developed by Gould-Modicon, is widely used in industrial communications to integrate PLC's, computer, terminals and other various I/O devices. Intelligent JetI/O Server equipped with communication interface provides an Ethernet communication links with Modbus/TCP protocol support.

Modbus/TCP is a variant of the Modbus family of communication protocol. Modbus/TCP is a Master/Slave communication protocol, A master (a host PC) initiates queries, a slave (one of the JetI/O servers) then responds by supplying the requested data to the master by using Modbus/TCP commands.

5.1.2 Function Code (FC)

The JetI/O Server uses a subset of the standard Modbus/TCP function code to access device-dependent information. Modbus/TCP function code is defined as below.

FC	Name	Usage
01	Read Coils	Read the state of a digital output
02	Read Input Status	Read the state of a digital input
03	Read Holding Register	Read holding register in 16-bits register format
04	Read Input Registers	Read data in 16-bits register format
05	Write Coil	Write data to force a digital output ON/OFF
06	Write Single Register	Write data in 16-bits register format
15	Force Multiple Coils	Write data to force multiple consecutive coils

5.1.3 Error Checking

The utilization of the error checking will help eliminate errors caused by noise in the communication link. In Modbus/TCP mode, messages include an error-checking field that is based on a Cyclical Redundancy Check (CRC) method. The CRC filed checks the contents of the entire message. It applied regardless of any parity check method used for the individual BYTE acters of the message. The CRC value is calculated by the transmitting device, which appends the CRC to the message. The receiving device recalculates a CRC during receipt of the message, and compares the calculated value to the actual value it received in the CRC filed.

5.1.4 Exception Response

If an error occurs, the slave sends an exception response message to master consisting of the slave address, function code, exception response code and error check field. In an exception response, the slave sets the high-order bit (MSB) of the response function code to one. The exception response codes are listed below.

Code	Name	Descriptions
01	Illegal Function	The message function received is not allowable action.
02	Illegal Data Address	The address referenced in the data field is not valid.
03	Illegal Data Value	The value referenced at the addressed device location is no within range.
04	Slave Device Failure	An unrecoverable error occurred while the slave was attempting to perform the requested action.
05	Acknowledge	The slave has accepted the request and processing it, but a long duration of time will be required to do so.
06	Slave Device Busy	The slave is engaged in processing a long-duration program command.
07	Negative Acknowledge	The slave cannot perform the program function received in the query.
08	Memory Parity Error	The slave attempted to read extended memory, but detected a parity error in the memory.

5.2 JetI/O 6550 Modbus/TCP Address Mapping

The address mapping of Modbus/TCP communications summarizes data address, name, data ranges, data attributes (R: read, W: write).

JetI/O 6550 Common Register Map (Holding Registers)			
Protocol Address (Hex)	**PLC Address (Decimal)**	**Access**	**Description**
0000	40001	R/W	(Read/Write) Watch-dog enable/disable **R/W:AABB** **AABB:0000H** (disable) **AABB:FF00H** (enable)
0001	40002	R/W	(Read/Write) Watch-dog cycle count **R/W:AABB** **AABB:0001H~00FFH** **BB:1 ~255** BB x 0.1 (sec)=count cycle (sec)
0002	40003	R/W	**R:** Read the host-watchdog status **W:** Reset the host-watchdog status **R:AABB** **AABB:0000H** (remote module OK) **AABB:FF00H** (host-watchdog fail) **W: AABB** **AABB:FF00H(reset)**
0003	40004	R	Read the firmware version **R:AAAA** **AAAA:F10A (HEX)**
0004	40005	R	Read module name

			R:AAAA **AAAA: 6550(HEX)**
0005	40006	R	Read reset status **R:AABB** **AABB:0000H** (after using this read command) **AABB:0001H**(The value is equal to0001H after reset module)
0006	40007	R/W	**R:** Read power on value **W:** Setting present coil value is POWERON value Read: Write: **R:AABB** **W:FF00(action value)** **AABB:0000H~00FFH** (write to EEprom)
0007	40008	R/W	**R:** Read safe value **W:** Setting present coil value is SAFE value Read: Write: **R:AABB** **W:FF00 (action value)** **AABB:0000H~00FFH** (write to EEprom)
0008	40009	R/W	(Read/Write) DI Counter status **R/W:** 00xxxxxxxxxxxxxx (bin) Bit 0 is channel 0 0: Off 1: On (start DI count)
0009	40010	R/W	(Read/Write) DI Counter Overflow status **R/W:** 00xxxxxxxxxxxxxx (bin) Bit 0 is channel 0 Read: 0 : Normal 1 : Overflow Write: 0 : clear overflow status 1 : return illegal Data Value
000A	40011	R/W	(Read/Write) DI Counter Trigger Mode **R/W:** 00xxxxxxxxxxxxxx (bin) Bit 0 is channel 0 0 : Low to High 1 : High to Low (write to EEprom)
000B	40012	R/W	(Read/Write) DI Mode **R/W:** 00xxxxxxxxxxxxxx (bin) Bit 0 is channel 0 0 : DI 1 : Counter (write to EEprom)
000C	40013	R/W	(Read/Write) DI Counter Power-On Status **R/W:** 000xxxxxxxxxxxxx (bin) Bit 0 is channel 0 0 : Off 1 : On (write to EEprom)
000D	40014	R/W	(Read/Write) DI Counter Safe Status **R/W:** 00xxxxxxxxxxxxxx (bin) Bit 0 is channel 0 0 : Off 1 : On (write to EEprom)
000E	40015	R/W	(Read/Write) DI Clear Counter Value **R:** always 0 **W:** 00xxxxxxxxxxxxxx (bin) Bit 0 is channel 0 Write 1: Clear Counter Value 0: Return illegal data value
000F	40016	R/W	(Read/Write) DO Pulse Operate Status **R/W:** 000xxxxxxxxxxxxx (bin)

			Bit 0 is channel 0 0 : Off 1 : On (start DO pulse output)
0010	40017	R/W	(Read/Write) DO Power-On Pulse Operate Status **R/W:** 000xxxxxxxxxxxx (bin) Bit 0 is channel 0 0 : Off 1 : On (write to EEprom)
0011	40018	R/W	(Read/Write) DO Safe Pulse Operate Status **R/W:** 000xxxxxxxxxxxx (bin) Bit 0 is channel 0 0 : Off 1 : On (write to EEprom)
0012	40019	R/W	(Read/Write) Channel 0 DO Pulse Output Count Value Hi-Word
0013	40020	R/W	(Read/Write) Channel 0 DO Pulse Output Count Value Low-Word 0: Continuous count 1~ FFFFFFFF : number of puls (write to EEprom)
0014	40021	R/W	(Read/Write) Channel 1 DO Pulse Output Count Value Hi-Word
0015	40022	R/W	(Read/Write) Channel 1 DO Pulse Output Count Value Low-Word 0: Continuous count 1~ FFFFFFFF : number of pulse(write to EEprom)
0016	40023	R/W	(Read/Write) Channel 2 DO Pulse Output Count Value Hi-Word
0017	40024	R/W	(Read/Write) Channel 2 DO Pulse Output Count Value Low-Word 0: Continuous count 1~ FFFFFFFF : number of pulse(write to EEprom)
0018	40025	R/W	(Read/Write) Channel 3 DO Pulse Output Count Value Hi-Word
0019	40026	R/W	(Read/Write) Channel 3 DO Pulse Output Count Value Low-Word 0: Continuous count 1~ FFFFFFFF : number of puls (write to EEprom)
001A	40027	R/W	(Read/Write) Channel 4 DO Pulse Output Count Value Hi-Word
001B	40028	R/W	(Read/Write) Channel 4 DO Pulse Output Count Value Low-Word 0: Continuous count 1~ FFFFFFFF : number of puls (write to EEprom)
001C	40029	R/W	(Read/Write) Channel 5 DO Pulse Output Count Value Hi-Word
001D	40030	R/W	(Read/Write) Channel 5 DO Pulse Output Count Value Low-Word 0: Continuous count 1~ FFFFFFFF : number of puls (write to EEprom)
001E	40031	R/W	(Read/Write) Channel 6 DO Pulse Output Count Value Hi-Word
001F	40032	R/W	(Read/Write) Channel 6 DO Pulse Output Count Value Low-Word 0: Continuous count 1~ FFFFFFFF : number of puls (write to EEprom)
0020	40033	R/W	(Read/Write) Channel 7 DO Pulse Output Count Value Hi-Word

0021	40034	R/W	(Read/Write) Channel 7 DO Pulse Output Count Value Low-Word 0: Continuous count 1~ FFFFFFFF : number of puls (write to EEprom)
0022	40035	R/W	(Read/Write) Channel 0 DO Pulse Low Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
0023	40036	R/W	(Read/Write) Channel 1 DO Pulse Low Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
0024	40037	R/W	(Read/Write) Channel 2 DO Pulse Low Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
0025	40038	R/W	(Read/Write) Channel 3 DO Pulse Low Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
0026	40039	R/W	(Read/Write) Channel 4 DO Pulse Low Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
0027	40040	R/W	(Read/Write) Channel 5 DO Pulse Low Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
0028	40041	R/W	(Read/Write) Channel 6 DO Pulse Low Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
0029	40042	R/W	(Read/Write) Channel 7 DO Pulse Low Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
002A	40043	R/W	(Read/Write) Channel 0 DO Pulse High Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
002B	40044	R/W	(Read/Write) Channel 1 DO Pulse High Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
002C	40045	R/W	(Read/Write) Channel 2 DO Pulse High Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
002D	40046	R/W	(Read/Write) Channel 3 DO Pulse High Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
002E	40047	R/W	(Read/Write) Channel 4 DO Pulse High Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
002F	40048	R/W	(Read/Write) Channel 5 DO Pulse High Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
0030	40049	R/W	(Read/Write) Channel 6 DO Pulse High Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
0031	40050	R/W	(Read/Write) Channel 7 DO Pulse High Signal Width **R/W:** (1 ~ FFFF)* 1ms (write to EEprom)
0032	40051	R/W	(Read/Write) DO Mode **R/W:** 000xxxxxxxxxxxxx (bin) Bit 0 is channel 0 0 : DO 1 : Pulse (write to EEprom)
0033	40052	R/W	(Read/Write) Select “OR” or “AND” **R:AAAA(hex)** **W: AAAA (hex)** AAAA:00000000xxxxxxxx X: 0 “OR” Logic 1 “AND” Logic
0034	40053	R/W	(Read/Write) RuleEnable Logic 0~7 **R: 00000000xxxxxxxx(bit)** **W: 00000000xxxxxxxx(bit)** 0: disable 1: enable
0035	40054	R/W	(Read/Write) Select condition DI for Logic 0 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DI Channel B: condition #2 DI Channel B: condition #1 DI Channel

			D: condition #0 DI Channel
0036	40055	R/W	(Read/Write) Select condition DI for Logic1 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DI Channel B: condition #2 DI Channel B: condition #1 DI Channel D: condition #0 DI Channel
0037	40056	R/W	(Read/Write) Select condition DI for Logic 2 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DI Channel B: condition #2 DI Channel B: condition #1 DI Channel D: condition #0 DI Channel
0038	40057	R/W	(Read/Write) Select condition DI for Logic 3 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DI Channel B: condition #2 DI Channel B: condition #1 DI Channel D: condition #0 DI Channel
0039	40058	R/W	(Read/Write) Select condition DI for Logic 4 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DI Channel B: condition #2 DI Channel B: condition #1 DI Channel D: condition #0 DI Channel
003A	40059	R/W	(Read/Write) Select condition DI for Logic 5 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DI Channel B: condition #2 DI Channel B: condition #1 DI Channel D: condition #0 DI Channel
003B	40060	R/W	(Read/Write) Select condition DI for Logic 6 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DI Channel B: condition #2 DI Channel B: condition #1 DI Channel D: condition #0 DI Channel
003C	40061	R/W	(Read/Write) Select condition DI for Logic 7 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DI Channel B: condition #2 DI Channel B: condition #1 DI Channel D: condition #0 DI Channel
003D	40062	R/W	(Read/Write) Select Operators condition for Logic 0 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators condition #3 Logic B: Operators condition #2 Logic B: Operators condition #1 Logic D: Operators condition #0 Logic

			Value: 0 : ON 1:OFF 2:Lo-Hi 3:Hi-Lo 4: “=” 5:”>” 6:”<” 7:”>=” 8:”<=”
003E	40063	R/W	(Read/Write) Select Operators condition for Logic 1 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators condition #3 Logic B: Operators condition #2 Logic B: Operators condition #1 Logic D: Operators condition #0 Logic Value: 0 : ON 1:OFF 2:Lo-Hi 3:Hi-Lo 4: “=” 5:”>” 6:”<” 7:”>=” 8:”<=”
003F	40064	R/W	(Read/Write) Select Operators condition for Logic 2 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators condition #3 Logic B: Operators condition #2 Logic B: Operators condition #1 Logic D: Operators condition #0 Logic
0040	40065	R/W	(Read/Write) Select Operators condition for Logic 3 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators condition #3 Logic B: Operators condition #2 Logic B: Operators condition #1 Logic D: Operators condition #0 Logic Value: 0 : ON 1:OFF 2:Lo-Hi 3:Hi-Lo 4: “=” 5:”>” 6:”<” 7:”>=” 8:”<=”
0041	40066	R/W	(Read/Write) Select Operators condition for Logic 4 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators condition #3 Logic B: Operators condition #2 Logic B: Operators condition #1 Logic

			D: Operators condition #0 Logic Value: 0 : ON 1:OFF 2:Lo-Hi 3:Hi-Lo 4: “=” 5:”>” 6:”<” 7:”>=” 8:”<=”
0042	40067	R/W	(Read/Write) Select Operators condition for Logic 5 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators condition #3 Logic B: Operators condition #2 Logic B: Operators condition #1 Logic D: Operators condition #0 Logic Value: 0 : ON 1:OFF 2:Lo-Hi 3:Hi-Lo 4: “=” 5:”>” 6:”<” 7:”>=” 8:”<=”
0043	40068	R/W	(Read/Write) Select Operators condition for Logic 6 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators condition #3 Logic B: Operators condition #2 Logic B: Operators condition #1 Logic D: Operators condition #0 Logic Value: 0 : ON 1:OFF 2:Lo-Hi 3:Hi-Lo 4: “=” 5:”>” 6:”<” 7:”>=” 8:”<=”
0044	40069	R/W	(Read/Write) Select Operators condition for Logic 7 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators condition #3 Logic B: Operators condition #2 Logic B: Operators condition #1 Logic D: Operators condition #0 Logic Value: 0 : ON 1:OFF 2:Lo-Hi 3:Hi-Lo

			4: “=” 5:”>” 6:”<” 7:”>=” 8:”<=”
0045	40070	R/W	(Read/Write) Select THEN DO for Logic 0 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DO Channel B: condition #2 DO Channel B: condition #1 DO Channel D: condition #0 DO Channel
0046	40071	R/W	(Read/Write) Select THEN DO for Logic 1 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DO Channel B: condition #2 DO Channel B: condition #1 DO Channel D: condition #0 DO Channel
0047	40072	R/W	(Read/Write) Select THEN DO for Logic 2 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DO Channel B: condition #2 DO Channel B: condition #1 DO Channel D: condition #0 DO Channel
0048	40073	R/W	(Read/Write) Select THEN DO for Logic 3 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DO Channel B: condition #2 DO Channel B: condition #1 DO Channel D: condition #0 DO Channel
0049	40074	R/W	(Read/Write) Select THEN DO for Logic 4 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DO Channel B: condition #2 DO Channel B: condition #1 DO Channel D: condition #0 DO Channel
004A	40075	R/W	(Read/Write) Select THEN DO for Logic 5 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DO Channel B: condition #2 DO Channel B: condition #1 DO Channel D: condition #0 DO Channel
004B	40076	R/W	(Read/Write) Select THEN DO for Logic 6 **R: ABCD(hex)** **W: ABCD(hex)** A: condition #3 DO Channel B: condition #2 DO Channel B: condition #1 DO Channel D: condition #0 DO Channel
004C	40077	R/W	(Read/Write) Select THEN DO for Logic 7 **R: ABCD(hex)** **W: ABCD(hex)**

			A: condition #3 DO Channel B: condition #2 DO Channel B: condition #1 DO Channel D: condition #0 DO Channel
004D	40078	R/W	(Read/Write) Select Operators Action for Logic 0 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators Action #3 B: Operators Action #2 B: Operators Action #1 D: Operators Action #0 Value: 0 : ON 1: OFF 2: Counter reset 3: DO pulse output start 4: DO pulse output stop 5: SNMP Trap
004E	40079	R/W	(Read/Write) Select Operators Action for Logic 1 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators Action #3 B: Operators Action #2 B: Operators Action #1 D: Operators Action #0 Value: 0 : ON 1: OFF 2: Counter reset 3: DO pulse output start 4: DO pulse output stop 5: SNMP Trap
004F	40080	R/W	(Read/Write) Select Operators Action for Logic 2 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators Action #3 B: Operators Action #2 B: Operators Action #1 D: Operators Action #0 Value: 0 : ON 1: OFF 2: Counter reset 3: DO pulse output start 4: DO pulse output stop 5: SNMP Trap
0050	40081	R/W	(Read/Write) Select Operators Action for Logic 3 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators Action #3 B: Operators Action #2 B: Operators Action #1 D: Operators Action #0 Value: 0 : DO ON 1: DO OFF 2: DI Counter reset

			3: DO pulse output start 4: DO pulse output stop 5: SNMP Trap
0051	40082	R/W	(Read/Write) Select Operators Action for Logic 4 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators Action #3 B: Operators Action #2 B: Operators Action #1 D: Operators Action #0 Value: 0 : ON 1: OFF 2: Counter reset 3: DO pulse output start 4: DO pulse output stop 5: SNMP Trap
0052	40083	R/W	(Read/Write) Select Operators Action for Logic 5 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators Action #3 B: Operators Action #2 B: Operators Action #1 D: Operators Action #0 Value: 0 : ON 1: OFF 2: Counter reset 3: DO pulse output start 4: DO pulse output stop 5: SNMP Trap
0053	40084	R/W	(Read/Write) Select Operators Action for Logic 6 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators Action #3 B: Operators Action #2 B: Operators Action #1 D: Operators Action #0 Value: 0 : ON 1: OFF 2: Counter reset 3: DO pulse output start 4: DO pulse output stop 5: SNMP Trap
0054	40085	R/W	(Read/Write) Select Operators Action for Logic 7 **R: ABCD(hex)** **W: ABCD(hex)** A: Operators Action #3 B: Operators Action #2 B: Operators Action #1 D: Operators Action #0 Value: 0 : ON 1: OFF 2: Counter reset 3: DO pulse output start

			4: DO pulse output stop 5: SNMP Trap
0055	40086	R/W	(Read/Write) ConditionEnable[0] Rule 0 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
0056	40087	R/W	(Read/Write) ConditionEnable[1] Rule 1 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
0057	40088	R/W	(Read/Write) ConditionEnable[2] Rule 2 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
0058	40089	R/W	(Read/Write) ConditionEnable[3] Rule 3 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
0059	40090	R/W	(Read/Write) ConditionEnable[4] Rule 4 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
005A	40091	R/W	(Read/Write) ConditionEnable[5] Rule 5 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
005B	40092	R/W	(Read/Write) ConditionEnable[6] Rule 6 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
005C	40093	R/W	(Read/Write) ConditionEnable[7] Rule 7 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
005D	40094	R/W	(Read/Write) CheckTime for Rule 0 **R: ABCD(hex)** **W: ABCD(hex)** ABCD: 0~FFFF (sec) 0 sec means trigger once
005E	40095	R/W	(Read/Write) CheckTime for Rule 1 **R: ABCD(hex)** **W: ABCD(hex)** ABCD: 0~FFFF (sec) 0 sec means trigger once
005F	40096	R/W	(Read/Write) CheckTime for Rule 2 **R: ABCD(hex)** **W: ABCD(hex)** ABCD: 0~FFFF (sec) 0 sec means trigger once
0060	40097	R/W	(Read/Write) CheckTime for Rule 3 **R: ABCD(hex)** **W: ABCD(hex)** ABCD: 0~FFFF (sec) 0 sec means trigger once
0061	40098	R/W	(Read/Write) CheckTime for Rule 4 **R: ABCD(hex)** **W: ABCD(hex)** ABCD: 0~FFFF (sec) 0 sec means trigger once
0062	40099	R/W	(Read/Write) CheckTime for Rule 5 **R: ABCD(hex)** **W: ABCD(hex)**

			ABCD: 0~FFFF (sec) 0 sec means trigger once
0063	40100	R/W	(Read/Write) CheckTime for Rule 6 **R: ABCD(hex)** **W: ABCD(hex)** ABCD: 0~FFFF (sec) 0 sec means trigger once
0064	40101	R/W	(Read/Write) CheckTime for Rule 7 **R: ABCD(hex)** **W: ABCD(hex)** ABCD: 0~FFFF (sec) 0 sec means trigger once
0065	40102	R/W	(Read/Write) ActionEnable for Rule 0 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
0066	40103	R/W	(Read/Write) ActionEnable for Rule 1 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
0067	40104	R/W	(Read/Write) ActionEnable for Rule 2 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
0068	40105	R/W	(Read/Write) ActionEnable for Rule 3 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
0069	40106	R/W	(Read/Write) ActionEnable for Rule 4 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
006A	40107	R/W	(Read/Write) ActionEnable for Rule 5 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
006B	40108	R/W	(Read/Write) ActionEnable for Rule 6 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
006C	40109	R/W	(Read/Write) ActionEnable for Rule 7 **R: 000X(hex)** **W: 000X(hex)** X:0000~1111 0:disable 1:enable
006D	40110	R/W	(Read/Write) SMNP Trap Number **R: 000X(hex)** **W: 000X(hex)** X:1~4 Trap Number
006E	40111	R/W	(Read/Write)SNMP Trap IP1 Lo-Word **R: AABB(hex)** **W: AABB(hex)** IP=X.X.AA.BB
006F	40112	R/W	(Read/Write)SNMP Trap IP1 Hi-Word **R: AABB(hex)** **W: AABB(hex)** IP=AA.BB.X.X
0070	40113	R/W	(Read/Write)SNMP Trap IP2 Lo-Word **R: AABB(hex)** **W: AABB(hex)** IP=X.X.AA.BB

0071	40114	R/W	(Read/Write)SNMP Trap IP2 Hi-Word **R: AABB(hex)** **W: AABB(hex)** IP=AA.BB.X.X
0072	40115	R/W	(Read/Write)SNMP Trap IP3 Lo-Word **R: AABB(hex)** **W: AABB(hex)** IP=X.X.AA.BB
0073	40116	R/W	(Read/Write)SNMP Trap IP3 Hi-Word **R: AABB(hex)** **W: AABB(hex)** IP=AA.BB.X.X
0074	40117	R/W	(Read/Write)SNMP Trap IP4 Lo-Word **R: AABB(hex)** **W: AABB(hex)** IP=X.X.AA.BB
0075	40118	R/W	(Read/Write)SNMP Trap IP4 Hi-Word **R: AABB(hex)** **W: AABB(hex)** IP=AA.BB.X.X
0076	40119	R/W	(Read/Write) Reset DI counter for Rule 0 **R/W: ABCD(hex)** A: Reset #3 DI Channel B: Reset #2 DI Channel B: Reset #1 DI Channel D: Reset #0 DI Channel
0077	40120	R/W	(Read/Write) Reset DI counter for Rule 1 **R/W: ABCD(hex)** A: Reset #3 DI Channel B: Reset #2 DI Channel B: Reset #1 DI Channel D: Reset #0 DI Channel
0078	40121	R/W	(Read/Write) Reset DI counter for Rule 2 **R/W: ABCD(hex)** A: Reset #3 DI Channel B: Reset #2 DI Channel B: Reset #1 DI Channel D: Reset #0 DI Channel
0079	40122	R/W	(Read/Write) Reset DI counter for Rule 3 **R/W: ABCD(hex)** A: Reset #3 DI Channel B: Reset #2 DI Channel B: Reset #1 DI Channel D: Reset #0 DI Channel
007A	40123	R/W	(Read/Write) Reset DI counter for Rule 4 **R/W: ABCD(hex)** A: Reset #3 DI Channel B: Reset #2 DI Channel B: Reset #1 DI Channel D: Reset #0 DI Channel
007B	40124	R/W	(Read/Write) Reset DI counter for Rule 5 **R/W: ABCD(hex)** A: Reset #3 DI Channel B: Reset #2 DI Channel B: Reset #1 DI Channel D: Reset #0 DI Channel
007C	40125	R/W	(Read/Write) Reset DI counter for Rule 6

			R/W: ABCD(hex) A: Reset #3 DI Channel B: Reset #2 DI Channel B: Reset #1 DI Channel D: Reset #0 DI Channel
007D	40126	R/W	(Read/Write) Reset DI counter for Rule 7 **R/W: ABCD(hex)** A: Reset #3 DI Channel B: Reset #2 DI Channel B: Reset #1 DI Channel D: Reset #0 DI Channel

JetI/O 6550 DI Counter Register Map (Input Register)			
Protocol Address (Hex)	**PLC Address (Decimal)**	**Access**	**Description**
0000	30001	R	Channel 0 DI Counter Value Hi-Word
0001	30002	R	Channel 0 DI Counter Value Low-Word
0002	30003	R	Channel 1 DI Counter Value Hi-Word
0003	30004	R	Channel 1 DI Counter Value Low-Word
0004	30005	R	Channel 2 DI Counter Value Hi-Word
0005	30006	R	Channel 2 DI Counter Value Low-Word
0006	30007	R	Channel 3 DI Counter Value Hi-Word
0007	30008	R	Channel 3 DI Counter Value Low-Word
0008	30009	R	Channel 4 DI Counter Value Hi-Word
0009	30010	R	Channel 4 DI Counter Value Low-Word
000A	30011	R	Channel 5 DI Counter Value Hi-Word
000B	30012	R	Channel 5 DI Counter Value Low-Word
000C	30013	R	Channel 6 DI Counter Value Hi-Word
000D	30014	R	Channel 6 DI Counter Value Low-Word
000E	30015	R	Channel 7 DI Counter Value Hi-Word
000F	30016	R	Channel 7 DI Counter Value Low-Word
0010	30017	R	Channel 8 DI Counter Value Hi-Word
0011	30018	R	Channel 8 DI Counter Value Low-Word
0012	30019	R	Channel 9 DI Counter Value Hi-Word
0013	30020	R	Channel 9 DI Counter Value Low-Word
0014	30021	R	Channel 10 DI Counter Value Hi-Word
0015	30022	R	Channel 10 DI Counter Value Low-Word
0016	30023	R	Channel 11 DI Counter Value Hi-Word
0017	30024	R	Channel 11 DI Counter Value Low-Word
0018	30025	R	Channel 12 DI Counter Value Hi-Word
0019	30026	R	Channel 12 DI Counter Value Low-Word
001A	30027	R	Channel 12 DI Counter Value Hi-Word
001B	30028	R	Channel 12 DI Counter Value Low-Word

JetI/O 6550 Digital Input Register Map (Input Status)			
Protocol Address (Hex)	**PLC Address (Decimal)**	**Access**	**Description**
0000	10001	R	Channel 0 Digital input signal
0001	10002	R	Channel 1 Digital input signal
0002	10003	R	Channel 2 Digital input signal
0003	10004	R	Channel 3 Digital input signal
0004	10005	R	Channel 4 Digital input signal
0005	10006	R	Channel 5 Digital input signal
0006	10007	R	Channel 6 Digital input signal
0007	10008	R	Channel 7 Digital input signal
0009	10009	R	Channel 8 Digital input signal
000A	10010	R	Channel 9 Digital input signal
000B	10011	R	Channel 10 Digital input signal
000C	10012	R	Channel 11 Digital input signal
000D	10013	R	Channel 12 Digital input signal
000E	10014	R	Channel 13 Digital input signal

JetI/O 6550 Digital Output Register Map (Coil Status)			
Protocol Address (Hex)	**PLC Address (Decimal)**	**Access**	**Description**
0000	00001	R/W	Channel 0 Digital Output signal
0001	00002	R/W	Channel 1 Digital Output signal
0002	00003	R/W	Channel 2 Digital Output signal
0003	00004	R/W	Channel 3 Digital Output signal
0004	00005	R/W	Channel 4 Digital Output signal
0005	00006	R/W	Channel 5 Digital Output signal
0006	00007	R/W	Channel 6 Digital Output signal
0007	00008	R/W	Channel 7 Digital Output signal

Note: When the host failed, writing output coil is invalid and return exception code 04.

6. Appendix

6.1 SNMP MIB

An SNMP to I/O MIB file that can help you monitor I/O status with SNMP software. You can find the MIB file on the package.

(I). Public- System MIB:

Object ID (OID)	Description	Community, R/W Access
sysDescr	The *sysDescr* directive is used to define the system description of the host on which the SNMP agent (server) is running. This description is used for the *sysDescr* object instance of the MIB-II. SYNTAX: *DisplayString* (SIZE (0..31))	Public, Read Only
sysObjectID	The vendor's authoritative identification of the network management subsystem contained in the entity. This value is allocated within the SMI enterprises subtree. SYNTAX: *DisplayString* (SIZE (0..31))	Public, Read Only
sysUpTime	The *sysUpTime* directive is used to measures the time, in hundredths of a second, since the last system restart. SYNTAX: *DisplayString* (SIZE (0..31))	Public, Read Only
sysContact	The *sysContact* directive is used to define the system contact address used for the *sysContact* object instance of the MIB-II. SYNTAX: *DisplayString* (SIZE (0..31))	Public, Read Only
sysName	The *sysName* directive is a string containing an administratively-assigned name for the system running the SNMP agent. By convention, this should be its fully-qualified domain name. SYNTAX: *DisplayString* (SIZE (0..31))	Public, Read Only
sysLocation	The *sysLocation* directive is used to define the location of the host on which the SNMP agent (server) is running. This directive is used for the *sysLocation* object instance of the MIB-II. SYNTAX: *DisplayString* (SIZE (0..31))	Public, Read Only

(II).Private MIB - Intelligent I/O Server – 6510

Object ID (OID)	Description	Community, R/W Access
eioDIxxMode xx: 00-13	Digital input mode (0: DI; 1: Counter; Others: return Illegal Data Value) SYNTAX INTEGER (0..65535)	Private, Read/Write
eioDIxxStatus xx: 00-13	Digital input status, SYNTAX BIT (0/1)	Private, Read Only
eioDIxxCounterValue xx: 00-13	DI counter value, SYNTAX DWORD (32 bits)	Private, Read Only
eioDIxxClearCounter xx: 00-13	DI Clear Counter Value Read always: 0 Write: 1: Clear counter value 0: return Illegal Data Value SYNTAX BIT (0/1)	Private, Read/Write
eioDIxxCounterOverflow xx: 00-13	DI Counter Overflow Status Read: 0: Normal 1: Overflow Write: 0: clear overflow status 1: return Illegal Data Value SYNTAX BIT (0/1)	Private, Read/Write
eioDOxxMode xx: 00-7	Digital output mode (0: DO; 1: Pulse; Others: return Illegal Data Value) SYNTAX INTEGER (0..65535)	Private, Read/Write
eioDOxxStatus, xx: 00-07	Digital output status, SYNTAX BIT (0/1)	Private, Read/Write
eioDIxxPulseCount xx: 00-07	DO Pulse Output Count Value SYNTAX DWORD (32 bits)	Private, Read/Write
eioDIxxPulseWidth xx: 00-07	DO Pulse Low Signal Width SYNTAX INTEGER (0..65535)	Private, Read/Write
eioDOxxPowerOnValue xx: 00-07	Digital output power-on value register Channel 0 – Channel 7 SYNTAX INTEGER (0..65535)	Private, Read Only
eioDOxxSafetyValue xx: 00-07	Digital output safety value register Channel 0 – Channel 7 SYNTAX INTEGER (0..65535)	Private, Read Only
eioFirmwareVersion	Firmware Version, SYNTAX INTEGER (0..65535)	Private, Read Only

6.2 Revision History

Version	Description	Date
0.1	First draft version.	
0.1-Jan.10	Revised some wording, add how to upgrade firmware. Correct the latest figures.	Jan. 10, 2008